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There can be no doubt, therefore, that such an ethno-botanic garden would stimulate greatly the interest in aboriginal plants, and at the same time it would be of the greatest scientific value. Nothing of the kind has ever been attempted along the lines suggested above, and such a garden would soon become a Mecca for those who desire to write monographs upon our American plants and their uses among the aborigines.

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SCIENTIFIC LITERATURE.

Certain Sand Mounds of Florida: By CLARENCE B. MOORE.

I have elsewhere* called attention to the important work which Mr. Moore is doing toward the elucidation of the archaeology of Florida, a research to which he has given his personal attention for several years. The third memoir† on this subject contains the results of his field work from January 16th to June 16th, 1895.

Mr. Moore has now examined with great care nearly all the earthworks of the St. Johns and Ocklawaha valleys. Of this large number only two were erected after white contact. That is, in only two were found objects obtained from the whites and placed with the original interments in the mounds. In several instances glass beads and other manufactures of the whites were found on or near the surface of a mound, or with intrusive burials of recent times; and Mr. Moore shows how easily such recent things might be taken as evidence of recent origin of the mound in which they are found. It is only by such thorough work as Mr. Moore is doing that our American archaeology is advanced, and it is therefore with a feeling of satisfaction that we read the account of his careful field work and follow the true

archæologist from page to page as he patiently describes each mound and its contents, and notes the position of every skeleton and object described.

The author of these memoirs takes the field fully equipped for the thorough prosecution of this work, and employs from twenty to forty laborers under experienced guidance. He also prints and illustrates his papers in a handsome manner. The objects are well illustrated, nearly always of natural size, and, what is greatly to be commended, the artistic desire of the draughtsman to make them look a little better than the originals is not apparent here. The explorer in several instances states that he did not take to his collection in Philadelphia such and such potsherds or other fragmentary objects because he had many perfect specimens of the same type. This is to be regretted since every archæologist is not so fortunate as he, and the very potsherds which he discards would be treasured in many a museum, particularly as Mr. Moore's work in the field is so thorough that nothing is left for another in the same region. Even this regret is tempered when we know how liberal Mr. Moore has been in supplying several museums with representative collections from these Florida mounds.

It is yet too soon to draw conclusions as to the peopling of Florida or as to the time when these burial mounds were first formed. Wyman showed by his research that many of the shell mounds of the St. Johns were of great antiquity, and that there were certainly two and probably three phases in the life of the people who formed them. From Mr. Moore's explorations, it seems likely that the sand mounds—as old as many of them unquestionably are—belong to the later period of the shell mounds, and in a few instances come down to the time of European contact.

One of the questions not yet fully answered is that of the relation of the early people of Florida with other tribes. We know that among the most recent were the mixed people known as the Seminoles. We also know that Florida was inhabited in very early times, as shown by the discoveries of Pourtalés and later by Heilprin. We can now trace by the artifacts brought to light in the burial

*The Harvard Graduate Magazine of June, 1895.

† *Certain Sand Mounds of Duval County, Florida*; two mounds on Murphy Island, Florida; and certain Sand Mounds of the Ocklawaha River, Florida. By Clarence B. Moore. *Journal of the Academy of Natural Sciences of Philadelphia*, Vol. X., 1895, 4to, 108 pages. 91 illustrations in the text; two maps; 16 plates of pottery and a frontispiece illustrating a large conical mound.

mounds that there must have been a widely extended trade with tribes of the interior, and possibly a migration from the central portion of the continent to Florida. The large number of copper objects found by Mr. Moore, many of the same character and in some cases identical with those found in the Ohio mounds, is evidence of contact. The copper itself, which probably came from the Lake Superior region, is an important factor in this connection. The skulls found in the Florida mounds are of the brachycephalic type, closely resembling those from other southern mounds. The pottery, however, is different to a marked degree. The stone 'celts' or hatchets are distinctly of the extreme southern type, bordering on the West Indian. Is there Carib infusion from the islands or from the northern coast of South America? There are indications in this direction.

The oldest perfect skull known from Florida is extremely dolichocephalic and entirely different from the mound type. This was found by Wyman at the bottom of the great shell heap near Hawkingsville on the St. Johns. This heap was so old that its lower layers of the shells had become decomposed and transformed into a limestone in which this skull and other bones of the skeleton are firmly imbedded. We naturally question if this skeleton is not that of a survivor of the earlier people who were on the peninsula before the short-heads came.

Thus there is a complicated problem which can be solved only by such careful field work as was begun by the late Jeffries Wyman and is now being continued by Mr. Moore. In this connection it is interesting to know that Mr. Frank H. Cushing is now engaged in explorations on the west coast of Florida, under the auspices of the archaeological department of the University of Pennsylvania.

Mr. Moore in this last memoir has described and figured a number of vessels and singular objects of pottery, which he designates as 'mortuary' and 'freak' pottery. This pottery, to which I called attention in my notice of his first and second memoirs, is, thus far, peculiar to these Florida mounds. The forms he designates as 'freaks' are very odd and are apparently,

useless for any practical purpose. Perhaps *ceremonial* would be a better designation, since we know that among other peoples pottery of a certain character was made for ceremonial purposes, and that such vessels were often placed with the dead. That mortuary vessels were sometimes made for this special purpose is indicated by the fact that holes were purposely made in many of the vessels before they were subjected to burning or baking; while vessels of utility were sometimes perforated or even broken into several pieces before being placed in the mound. Among some tribes the breaking of a vessel or an implement is to 'kill' it, that its spirit may accompany the spirit of the dead person; and some such idea may have prevailed here. This would be another indication of the culture of the people coming from the west, which would agree with other facts pointing to such a migration of the southern brachycephali. It is also interesting to note here the resemblance in this respect to the mortuary customs of some of the peoples in Europe in ancient times who made special vessels of pottery for burial with the dead, and even manufactured them with holes in the bottom the same as was done in Florida. Is this simply a psychical coincidence in the development of culture in places so widely separated, or is it an indication of man's migration in early times?

On page 74 Mr. Moore gives an illustration of a little piece of pointed and oxidized iron, less than an inch long, which in itself seems insignificant. This fragment would have been overlooked by a less careful observer or would perhaps have been taken for the end of a nail and so put down as proof that the mound was made after European contact. Mr. Moore himself thinks that it must be carefully considered from this point of view, while at the same time he suggests that it may be of meteoric origin. To me this bit of iron is most significant, for it closely resembles several small awls or piercers I have found in the Ohio mounds, some of which were so well preserved as to furnish the proof that they are made of meteoric iron. In 1882 I was puzzled by a mass of iron rust and fragments of iron found during the exploration of the great group of mounds known as the Turner group in Anderson county, Ohio, where

Dr. Metz and I carried on a ten years' exploration for the Peabody Museum. The finding of this iron at first seemed to prove that the builders of the mound must have been in contact with Europeans, and yet I knew that every indication of great antiquity was present. Tree growth, formation of soil over the mounds, and the formation of limonite by infiltration, were among these evidences. Still here was iron in considerable quantities, and it became an important question as to its origin. A piece was cleaned for analysis and nickel was shown to be present. Then a mass weighing 37 ounces was cut, and the section showed crystals of olivine as well as the nickel. Soon we found we had ornaments and implements made of the same material. These were all made by hammering the metal in the same way as similar ornaments and implements were made of copper. Thus we proved that this ancient people had found masses of meteoric or native iron, and had used it the same as they did native copper. Since then I have identified ornaments and fragments from certainly three distinct meteorites in our explorations of Ohio mounds in widely separated parts of the State. Among the implements are small axes, chisels and awls or piercers. Some of the latter so closely resemble this piece found by Mr. Moore, particularly in its flaky oxidation, as to strongly suggest that the object is purely of native make from a piece of meteoric iron. I may mention here that native copper, native silver, native gold and native or meteoric iron were found together on one altar in the Turner group in Ohio, and also implements and ornaments made from these metals. In this connection I will again call the attention of archaeologists to the important contribution on the sources of native copper given in the second of this series of memoirs by Mr. Moore. In this he has shown that the copper objects from the mounds were made of *native* copper. He has thus confirmed the views of those archaeologists who have denied the European origin of the copper.

For many other interesting points relating to the art and culture of the people who buried their dead in these Florida mounds, I must refer the reader to these instructive memoirs. I am pleased to state that Mr. Moore is at the

present time continuing his researches in Florida, and we shall undoubtedly soon welcome another paper from him giving the results of this winter's work. F. W. PUTNAM.

PEABODY MUSEUM, HARVARD UNIVERSITY.

The Dispersal of Shells. An inquiry into the means of dispersal possessed by fresh-water and land Mollusca. By HARRY WALLIS KEW, F. Z. S., with a preface by ALFRED RUSSEL WALLACE, LL.D., F. R. S., etc. With illustrations. London, Kegan Paul, Trench, Trübner & Co., Ltd. 1893.

Although this little book has been published for some time, the subject is one of perennial interest, as naturalists will continue to gather facts bearing upon it. Though at first sight a rather limited field of inquiry, the author treats of it in a fairly comprehensive way, the chapters discussing the anomalies in local distribution, means of dispersal of fresh-water and of land shells, transplantation of bivalves and of univalves, the tenacity of life of land shells, the dispersal of slugs, the dispersal of fresh-water and land mollusca by man, the ninth and last chapter dealing with the fresh-water and land mollusca introduced into the British Isles by human agency.

The book will be of value to American conchologists and field naturalists, as it is by no means of local interest.

Of a curious nature are the facts collected by the author relating to the transportation of fresh water bivalves by insects, batrachians and birds, with the figures in illustration.

We see nothing special to criticise, nor are we aware of any omissions, except two which it would have been well for the author to have mentioned. The first is the introduction, by probably human agency, of *Helix hortensis* at different points on our northern coast, although it is not clearly proven that the species is not indigenous, yet this does not seem to us probable. Binney concludes that it has been undoubtedly imported to this continent.

In Gould's illustrated report on the invertebrata of Massachusetts, edited by Binney, this species is said to be "An European species introduced by commerce (?) to the northeastern portion of North America. It is found on